Leadership in Agile Software Development Methods

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Abstract. There is a common agreement that Leadership is represented by two main ideas: direction and influence. The first related to the knowledge of where the organization should be oriented and the second with the capacity to mobilize others towards that direction. Recent research has rejected these assumptions, stating emphatically that the power of organizations and teams are not in these mythical figures (as the super leader), but in the knowledge shared by all its members. Thus, finding the right direction and success on the path undertaken shall not rest in the hands of one person, but in the capabilities of the entire group.
This paper analyses how this approach to leadership can be observed in software development teams, specifically through agilists methods (Extreme Programming).

Keywords: Software development · Extreme programming · Leadership · Distributed leadership

1 The Definition of Leadership

It is extremely difficult to describe a unique definition to leadership. According with Thomson [16], not only leadership has multiple definition but also the number of definitions grows every year. Among the diverse 'labels' are "transformational, transactional, strategic, charismatic, paternalistic, bureaucratic, situational, operational, participatory, democratic, helpful, autocratic, laissez-faire, cash or evolutionary" [16]. Similarly, Husband [10] recognize in the mid-eighties, the plurality on the construct but expressed that all definition could be organized in three distinct clusters: "task - relationship; centralization - decentralization and power - influence" (p. 103). In other words leaders deal with performance and people; distribution and concentration of responsibilities; the capacity to lead others.

Moreover, the work of Leithwood, Day, Sammons, Harris, and Hopkins [12] tried to identify the core elements of effective leadership. Their findings suggest that all leadership definitions has at least to commons characteristics, all implies direction and influence. This means that 'a leader' exercise these two skills: setting the direction, goal, target or objective, and pushing others forward to that specific place. Therefore, leadership become a central capacity in any team or organization characterized by environmental change, rapid adaptation and flexibility [15]. In simply words, while we have a hard time trying to find a definitive definition for leadership, it connects with a wide range of concepts related with organizational change and adaptation, in which there is an important contribution of social forces and peoples behaviours [9].

Considering that leadership is mostly a construct related with the motivation and mobilization of people, recent studies have recognized the relevance of adopting a distributed approach [17]. This idea, abandon the romantic notion of one heroic leader who usually was born with the ability to lead others. On the contrary, leadership appears as a skill that not only can be develop by training, but also can be shared by different individuals or even groups within the organization. Additionally, the distributed approach related closely with turbulent context and rapid change, in which different individuals could emerge in different organizational moments or challenges, accordingly with their specifics skills.

Likewise, the benefits of distributed leadership has been extensively documented [13,14]. The evidence suggest that organizations who embrace this approach foster organizational learning, team work motivations and the sustainability of changing process. Understand leadership as distributed practices, also means to understand that all the people inside the organization or team can exercise power, set a direction and generate influence in others. From an organizational perspective, this perspective encourage the specialization and differentiation of the members, in order to prepare them for their eventual 'lead moment'.

Accordingly, distributed leadership is highly relevant for teams conformation. However, the distributed approach is not guaranty of success at least other conditions are put in place first. As the evidences suggest, teams only work effectively when its members perceive psychological safety, clear goals and shared meaning [5,11]. The study of Ashauer and Macan [1] identified how team performance could be highly explained by the role and practices of the leaders in trying to generate trust and collaboration. In these teams is encouraged the challenging of the professional and personal belief, therefore allowing new knowledge and change to be introduced. Similarly, the research of Cardno [6], identified that one of the most common enemies of team learning was 'fear to be ashamed by others'. This means that in many cases, people do not share their ideas freely, concerned by the opinions of their peers. Therefore, leaders main role in those situations is to ensure people are comfortable enough to share, listen and contribute to others, fostering adaptation and team growth.

2   Leadership in Software Developing Teams

Generally, leadership in software developing teams and particularly through agilistic methods are strongly influenced by a distributed approach to leadership [3, 4]. In these teams, 'directions and influence' can be observed when the team is aiming to develop and implement a new software. Specifically, for Extreme Programming, XP [2, 7, 8], the main characteristic of this method is the teamwork, that includes managers, costumers and developers. All of them work as part of the team dedicated to deliver quality software, and as result the software usually accomplish customer needs when it is needed. XP implements a simple and effective work development style as groupware and XP points out to improve a software project in four essential ways: communication, simplicity, feedback, and courage. These roles constitute in XP, a series of twelve practices: planner game, 40 hours a week, small deliveries, metaphors, on site customer, tests, simple design, coding standards, refactoring, pair programming, collective property, continuous integration, just open the rules and open work areas.

In Extreme Programming the roles are seven: the Customer, who writes the requirements and functional tests; the Programmer, who kept the code as simple as possible and helps the client to write functional tests; the Tester, who runs the functional tests; the Tracker, who tracks the estimates made by the team; the Coach, who is responsible for the overall process; the Consultant, who has specific expertise and, finally, the Manager, who is a link between the client and the programmers.

In terms of responsibilities, the Programmer is accountable for the outcome of the main project: the application system. This role writes source code for the software system under development. The Customer is the person who tells the programmer what to program. The programmer knows how to program. The customer knows what to program. The Tester is responsible to run the project repeatedly to create an update picture of the project state, besides, this role help customers to select and write functional tests. The Tracker is the ones who keep track of all the numbers in a project. This role is close to the reliability of the team. The person that plays this role knows all the records and facts of the project, and should be able to tell the team, when the next iteration is finish as planned. The Coach is the person responsible for the development process to work as a whole. The coach notices when the team is getting "off track and bring it "back on track. To do this, the coach must have experience with XP. The Consultant, is the person who has an expertise to processes a knowledge that the XP team needs as an additional special knowledge, so, they "hire a consultant who possesses this knowledge. The consultant transfers this knowledge to the team members, allowing them to solve the problem on their own. The Big Boss or Manager needs to know all the technical details and states of the project and know if any intervention is needed to have a successful project.

In particular, leadership is strongly connected with the total definition of the problem, the collection and analysis of the information, the development of solutions, and the facilitation of process and activities.

- The collection of information related to a problem in XP is made by the Client him-self, who has the first contact with the software development team. It Is not limited awareness of the problem that the client declare, but also aims to ensure, at all times, the collection of the necessary information to define and even redefine the problem.
- In XP, the Client and the Manager of the team, work together to define the problem and look for the possible solutions.
- The function of transforming the information, create new relations, and consequently generate interesting solutions, is the Programmer. In XP methodology he/she is in charge of the analysis, design and programming of software.
- In XP, the person who clarifies and evaluates the new ideas, in terms of its feasibility, is the Tester and the Tracker.
- In XP, the responsibility to make the definitive selection of the solutions is the Tracker and the Client.
- The person who has to implement the selected ideas (the working software) would be the Client, including the processes and procedures that this role implies.
- The Facilitator is the person that helps the team. This role is represented in XP to the coach.
- The role to help the team to work would be equivalent to the role of the consultant in XP.

3   Conclusion

The roles in XP are characterized by high professional interaction among its members and the respective client. As was presented previously, a distributed approach to leadership is best suited in teams like these who are mostly working with finding and gathering information, analysing and interpreting data, and taking decisions to improve working condition.

However, future studies should put more attention in the role of the manager or Big Boss, considering that the current data is to slim yet for such an important role in XP teams.

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